REMARKS/ARGUMENTS

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

The disclosure was objected to for use of non-idiomatic English. The specification has been amended appropriately, by way of a substitute specification submitted in accordance with 37 CFR 1.125. The specification contains no new matter.

Claims 4-12 were objected to for improper multiple dependencies. The claims have been amended appropriately herein to obviate the objection.

A new claim 13 has been added by amendment herein.

Claims 1-3 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. The claims have been appropriately amended herein to obviate the rejection.

Claims 1-3 were rejected under 35 U.S.C. 102(b) over German patent publication DE19605649 (hereinafter "Welsch"). For the following reasons, the rejection has been rendered moot by the present amendment of claim 1.

Regarding claim 1, Welsch does not teach a jet burner surface comprising "first surface areas provided on masses of foam ceramic, said first surface areas being permeable by said gaseous fuel, and second surface areas provided on a ceramic plate, said ceramic plate being impermeable by said gaseous fuel," as required. Welsch describes a burner plate comprising a fibre or textile mat. Welsch does not describe the use of a foam ceramic. Therefore, since every limitation of the claim is not taught by the reference, claim 1 and its dependent claims 2 and 3 are patentable over Welsch.

Claims 1-3 were further rejected under 35 U.S.C. 102(b) over Japanese patent publication 60-178208 (hereinafter "Komune"). For the following reasons, the rejection has been rendered moot by the present amendment of claim 1.

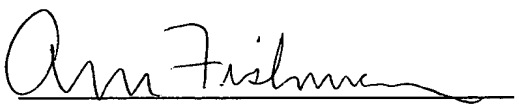
Regarding claim 1, Komune does not teach a jet burner surface comprising "first surface areas provided on masses of foam ceramics, said first surface areas being permeable by said gaseous fuel, and second surface areas provided on a ceramic plate, said ceramic plate being impermeable by said gaseous fuel," as required. Applicant can find no teaching in Komune of providing a burner surface on a foam ceramic. Therefore, since every limitation of the claim is not taught by the reference, claim 1 and its dependent claims 2 and 3 are patentable over Welsch.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 16-0820, our Order No. 35878.

Respectfully submitted,

PEARNE & GORDON LLP

By: 
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JET BURNER OPTIMIZED IN EFFICIENCY

BACKGROUND OF THE INVENTION

The present invention relates to a jet burner ~~in accordance with the preamble of patent claim 1~~, as well as a method for manufacturing the same~~, in accordance with the preamble of patent claims 10 and/or 12, respectively~~.

Jet burners for gas have long been known ~~since long~~. They are mainly ~~are~~ used as radiators, grills or heaters. Usually these known jet burners comprise punched ceramic plates or mats of ~~weaved~~woven or pressed metal fibers serving as burner surfaces ~~through~~. ~~which the g~~ Gaseous fuels are supplied through a burner pipe and a burner pot by means of a gas nozzle and a Venturi pipe to the burner surface~~;~~. The gaseous fuels penetrate the burner surface and are burned.

Moreover, for some time so-called "ceramic foam burners" have been known that are manufactured from sponge-like, porous ceramic materials~~, ceramics in particular~~. For example, such so-called "ceramic foam burners"~~, i.e.~~ and corresponding jet burner surfaces~~;~~ are manufactured ~~in that spongelike~~as follows. Sponge-like materials, ~~like e.g.~~such as foamed plastics of polyurethane, are soaked with liquid ceramic mass~~, wherein said soaked materials~~ and then are cured in a furnace~~, wherein s~~. Simultaneously, said sponge-like material, i.e. the foamed plastic, burns up and a porous sponge-like ceramic structure remains. This very porous sponge-like material shows an optimum permeability for the fuel gas and is perfectly suited as material for jet burner surfaces. The advantage of these materials ~~on one hand lies~~ ins that burners with jet burner surfaces made from so-called ceramic foams have a large output per area, which is

clearly superior to the above-described conventional materials, e.g. punched ceramic plates or metal fiber mats. In addition, this material provides excellent ~~burner-technological results with respect to their~~technical behavior in terms of exhaust gas technology, ~~i.e.~~ namely with respect to the output of disadvantageous carbon monoxides and nitrogen oxides (CO and Nox).

It is, however, a disadvantage in the known jet burners, and jet burner surfaces in particular, that the burner output related to the surface area cannot be regulated sufficiently, ~~for a cooking place burner in particular. Particularly, in ceramic foams also~~especially for use as a cooktop burner. Particularly, ceramic foams produce a high burner output per area ~~is given. This results in that~~. As a result, such jet burners with high burner output per area are ~~hardly~~not suitable for ~~given intended uses,~~applications where ~~in spite of a large surface of the burner~~ a comparatively low output is required over a large surface of the burner.

SUMMARY OF THE INVENTION

It is, therefore, the object of the present invention to create a jet burner in which ~~with~~ a certain given large surface ~~shows~~provides a ~~definite~~precise burner output, ~~also~~especially at comparatively low ~~in particular~~outputs. In addition it is to be manufactured in a simple manner ~~in particular,~~to produce good results in terms of burner technology, exhaust gas technology in particular, and permit regulation in the desired range.

This object is solved by a jet burner ~~showing~~ according to the ~~features of claim 1~~present invention, as well as a method for manufacturing a jet burner~~, as defined in the features of claims 10 or 12. Preferred embodiments are subject of the depending claims~~ according to the present invention.

The basic idea of the invention lies in that a generic jet burner is created which ~~is not like in~~, unlike the prior art ~~jet~~ jet burner that is formed with a uniform surface ~~but~~, is formed with a heterogeneous burner surface. Therein, the burner surface of heterogeneous structure comprises at least two different surface areas, namely a first active surface area permeable for the fuel ~~as well as~~and a second active surface area impermeable for the fuel. ~~In~~Preferably, the permeable, ~~preferably~~first active surface area provides a porous surface area so that the gas supplied to the jet burner can stream through said burner surface and ~~can~~ be burned ~~up correspondingly~~. At the second inactive surface area, a preferably ~~massive~~larger mass of material, no gas can penetrate and ~~burn~~ subsequently burn. In this way it is possible the adjust the output related to the entire burner surface in desired manner by the selection of the number or surface area ~~region~~size of the first active surface regions. ~~By p~~Providing multiple, ~~in particular~~ uniformly distributed first active surface regions of~~, however,~~ small surface are size ~~it in addition is also possible to~~can help guarantee a uniform distribution of the active regions in the burner surface so that uniform heating over the entire burner surface is possible.

Preferably, the burner surface of the jet burner is embodied such that a plurality of first active surface areas in the form of ~~nests is~~masses are supported in a second inactive surface area. It, e.g., has proved~~n~~ to be advantageous ~~here~~ to choose ceramic foam as first active surface areas, whereas the second surface area is formed by a ~~massive~~solid ceramic plate. Of course, it, however, also is possible to construct a jet burner in accordance with the present invention, using other materials for the burner surface, e.g. metal fiber mats or punched ceramics. In this case, ~~it only is necessary to find a suitable material for~~ the second inactive surface areas, ~~wherein here all~~can be formed of a suitable metals, ~~in particular~~such as high-temperature steels or

corresponding suitable alloys, or ~~also massive ceramic plates are available for selection. In this context it has to be noted that, of course, also in corresponding cases of use in which this is advantageous also a material mixture is conceivable, so that e.g.~~a ceramic plate. It is also conceivable that different types of material can be mixed, for example, the first active surface areas ~~for example are~~can be formed of ceramic foam, whereas the second inactive surface area ~~is~~can be formed of metal. ~~Preferably, h~~However, for ~~connection~~ technological reasons ~~in particular~~relating to joining the materials, materials of the same kind are generally used together, i.e. ceramic foams are used with ~~massive~~ ceramics ~~or~~and metal fiber mats are used with ~~massive~~solid metal plates. Beside ceramic foams, of course, ~~also~~ metallic foams can be used, as long as they ~~answer~~suitably meet the ~~demands to~~requirements of gas permeability ~~with respect to gas~~ and ~~to~~ thermal resistance.

The surface portion of the first active surface area preferably is adjusted in accordance with the desired output. A ~~favorable value~~suitable output range for thuse use of jet burners for grill and cooking appliances, ~~e.g. also in connection with~~including glass ceramic cooking sites, ~~lies in the range of~~is 0.5 to 10 kW, more preferably 1 to 5 kW ~~in particular~~, and most preferably 1 to 3 kW~~, with a~~. A suitable total burner surface ~~with~~for such uses can be provided by a circular burner surface having a diameter of 50 to 300 mm, more preferably 80 to 200 mm ~~in particular,~~ and most preferably 120 mm ~~in case of circular embodiment~~.

In order to ~~guarantee a particularly~~provide uniform heating over the entire burner surface, the first and/or second surface areas can have different sizes and/or shapes and be distributed in the burner surface correspondingly. In particular, uniform, raster-like or star-shaped arrangements with simple circular, strip-shaped, rod-shaped or curved (~~semi-circle etc.) offer themselves~~semi-

circular or the like) portions are suitable for this purpose.

A further advantage of the present invention~~, which also is subject of an independent claim category,~~ is the ~~simple manufacturability of~~simplicity in manufacturing the jet burner and/or a burner surface in accordance with the ~~embodiment of the jet burner according to the~~present invention~~, in particular~~. A jet burner in accordance with the present invention or a ~~corresponding~~similar burner surface can be manufactured in simple manner ~~in that~~, wherein two suitable materials are selected which are connectable with one another in a simple manner. ~~With these materials independently from one another p~~Planar formations ~~are manufactured (herein, it, however, also is conceivable that the formations have any desired shape, like semicircle, cylinder etc.), wherein from a first, in particular~~having the desired shapes are separately manufactures from each material. Specifically, masses are cut out or machined from a first heat-resistant material, which will be permeable to the fuel after completion ~~being permeable for t~~. The ~~fuel, nests~~masses are ~~cut out or manufactured~~formed in a shape and size that is complementary to openings ~~worked out~~formed in the second material, which will be impermeable to the fuel after completion ~~being impermeable for the fuel, or which was manufactured with these openings correspondingly. If now the nests permeable for the fuel~~. Then, the fuel-permeable masses are put into said openings of the ~~material impermeable for the fuel~~fuel-impermeable material and ~~solidly connected with one another~~bonded together. Thus, a burner surface in accordance with the present invention is manufactured in a simple manner.

This ~~is~~manufacturing method particularly ~~true also for~~applies to the preferred embodiment of the jet burner, in which said burner surface is formed of a ~~massive~~solid ceramic plate in which the ~~nests~~masses of foam ceramics are inserted. This kind of jet burner ~~namely~~

~~combines the~~provides advantages ~~that on one hand~~of using the best possible material in terms of burning technology, exhaust gas technology in particular, namely foam ceramics, ~~is selected,~~ ~~wherein~~while reducing the ~~per se~~ high burner output ~~per area~~ of foam ceramics ~~is reduced in that only corresponding nests~~by arranging masses of foam ~~ceramics are arranged~~ceramic in a ~~massive~~solid ceramic plate. ~~The arrangement of the nests of foam ceramics in the massive ceramic plate can be effected in that either the completely prepared nests are glued into the completely~~This arrangement can be produced by gluing prepared masses into a prepared ceramic plate. Alternatively, it is~~, however, also~~ possible to integrate the manufacturing process for the form ceramics into the manufacturing process for the finished burner surface~~, namely in that~~. Specifically, foamed plastics soaked with liquid ceramic mass, such as polyurethane ~~in particular,~~ ~~is~~, are inserted into a ceramic mass or ceramic plate provided with openings, this compound then being ~~burned~~fired, whereby said ceramic is cured and the foamed plastic is burned out so that ~~in this area~~ a porous ceramic foam is formed in a uniform ceramic surface.

A further simple possibility for manufacturing a jet burner in accordance with the present invention and/or a corresponding jet burner surface ~~resides in that an originally~~involves making a completely permeable surface, e.g. a porous foam ceramics, ~~is made impermeably partly, is sealed in particular~~partly impermeable by sealing it. In case of a porous foam ceramics, this might ~~e.g.~~ be done ~~in that~~by applying a liquid ~~ceramics is applied~~ceramic into the areas to be sealed and ~~is burned subsequently~~then firing the ceramic.

Further advantages, characteristics and features of the present invention become evident from the following detailed description of embodiments with reference to the attached drawing.

BRIEF DESCRIPTION OF DRAWINGS

~~The attached drawing therein in purely schematic manner in~~ FIGS. 1 to 6 ~~show~~ are schematic top views, each showing a different embodiments of a burner surface of a jet burner ~~in top view~~according to the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

FIG. 1 in shows a top view ~~shows~~of a circular burner surface 1 formed out of a circular ceramic plate 2 into which the snake-like porous foam ceramics 3 is imbedded. Said porous foam ceramics 3 ~~herein represents the~~provides an active burner portion area of said burner surface 1~~; acting as active burner portion in whose area also t~~. The ~~gas~~gaseous fuel is supplied through a burner pipe (not shown) and a burner pot by means of a gas nozzle (not shown either) and Venturi pipe, penetrates through said active burner surface and ~~burns there~~is burned.

Due to the snake-like ~~embodiment~~shape of said foam ceramic 3~~ in total a~~, an overall large-area burner surface 1 is ~~given, which, however, as compared to said~~provided. However, the foam ceramic 3 provides a relatively low burner output surface in comparison to the overall area of the burner surface 1~~ only has a restricted burner output~~.

~~The design~~A wide variety of variations in the form, the distribution and the portion of the active burner regions~~(~~, or first surface areas~~)~~, in said burner surface ~~can be constructed with high variability. It only has to be taken care that the portion is kept such that~~are possible. The variation of the design is limited only by the desired burner output related to the basic surface of said burner surface ~~is guaranteed~~ and the requirement that uniform heating is given over the entire area of said burner surface 1.

~~Without being restrictive, FIGS. 2 to 5 show various possibilities of design of~~By way of example only, FIGS. 2 to 6 show various additional design possibilities for said burner surface ~~with~~having said active surface areas ~~(~~, or first surface areas~~)~~ 3, and said inactive surface areas ~~(~~, or second surface area~~)~~s. Corresponding to FIGS. 2 to 6, said active surface areas 3 can be embodied in form of parallel strips, as wedges arranged in star shape, as circular dots, as semicircular arcs or a rods arranged perpendicularly to one another. They all have in common that they permit uniform distribution of said active surface areas 3 in said burner surface 1.

In spite of the fact that, in the shown embodiments of FIGS. 1 to 6, said burner surface 1 is always ~~is~~ formed as circular disk, it is also possible, of course, ~~also is possible~~ that the said burner surface ~~assumes~~can take any other suitable shape, e.g. rectangular, square, oval or the like.